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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,780	03/28/2006	Shunichi Fukuzumi	1422-0713PUS1	5508
2292	7590	10/09/2007		
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
			EXAMINER	
			THOMPSON RUMMEL, PONDER N	
			ART UNIT	PAPER NUMBER
			1795	
			NOTIFICATION DATE	DELIVERY MODE
			10/09/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

## Office Action Summary

Application No.

10/573,780

Applicant(s)

FUKUZUMI ET AL.

Examiner

Ponder N. Thompson-Rummel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 3-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 3-5, 7, 11, 12, 18 and 19 rejected under 35 U.S.C. 102(b) as being anticipated by Abura et al (Journal of American Chemical Society 2003, 125, 4149-4154).

With respect to claim 3-5, 7, 11, 12, 18 and 19, Abura et al. disclose a water-soluble hydride complex  $[\text{Cp}^*\text{Ir}^{\text{III}}(\text{bpy})\text{H}]^+$  (page 4149, paragraph 2) as complex (page 4149, paragraph 2) wherein the metal atom is iridium. The complex serves as a catalyst and can further be dissolved and recrystallized from methanol (page 4150, column 2, paragraph 1).

3. Claims 3, 4, 6, 7, 11 -14, 18, and 20 are rejected under 35 U.S.C. 102(b) as being anticipation by Ziessel (Journal American Chem. Society 1993, 115, 118-127).

With respect to claim 3, 4, 6, 7, 11 -14, 18, and 20, Ziessel discloses a compound comprising a metal hydride complex represented by the formula (2a) (see Scheme I, 2a-d – page 119) wherein the metal atom in formula (2a) is iridium (see Scheme I, 2a-d – page 119 and column 1, paragraph 3 - page 120). Further when the metal hydride complex is dissolved in an organic solvent,

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acetonitrile ( $\text{CH}_3\text{CN}$  - column 2, paragraph 1), the metal hydride complex is dissolved and is in solution. Ziessel additionally discloses a compound providing a metal hydride complex of formula (2a) wherein: (a) iridium represents the metal atom (Scheme I, 2a-d page 119); and (b) exciting the metal hydride complex by irradiating the metal hydride with white light until deprotonation takes place (page 122 -Table I, complex 2c, paragraph a).

With respect to claim 3, 6, 12 and 13, Ziessel further discloses compound providing a metal hydride complex of formula (2a) wherein: (a) iridium represents the metal atom (Scheme I, 2a-d page 119); and (b) exciting the metal hydride complex by irradiating the metal hydride with white light until deprotonation takes place (page 122 -Table I, complex 2c, paragraph a).

With respect to claims 4, 11, 18 and 20, Ziessel additionally discloses a compound of claim 3 wherein the metal hydride complex is dissolved in an organic solvent, acetonitrile ( $\text{CH}_3\text{CN}$  - column 2, paragraph 1).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 10 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ziessel (Journal American Chem. Society 1993, 115, 118-127) in view of Lenges et al. (Organometallics 2000, Volume 19, pages 1247-1254).

With respect to claims 10 and 17, Lenges et al. discloses a metal hydride complex of formula (1) wherein X, the metal atom, is cobalt (figure 2, page 1252 and paragraph 1). The cobalt complex (compound 13) meets the limitation for the compound of formula I in applicant's claim. For that reason it would have been obvious to one of ordinary skill within the art to deprotonate said cobalt complex as taught by Ziessel (Journal American Chem. Society 1993, 115, 118-127).

6. Claims 8, 9 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ziessel (Journal American Chem. Society 1993, 115, 118-127) in view of Amendola et al (US 2002/0083643).

With respect to claims 8, 9 15 and 16, Ziessel et al. discloses a metal hydride complex as an acid generator as comprising an iridium metal atom as disclosed by applicant's formula (1), however fails to mention the use of rhodium or ruthenium as the metal atom.

Amendola et al discloses a hydrogen generation catalyst in which transitional metal catalyst are used. Catalyst containing Group IB to Group VIIIB metals of the periodic table such as ruthenium and rhodium are preferred. These

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transitional metals catalyze chemical reactions and aid the hydrolysis of water by absorbing hydrogen in the form of atomic H such as hydride or protonic H<sup>+</sup> (paragraph [0040]). Therefore, it would have been obvious to include rhodium or ruthenium metal atoms in the place of the iridium atom within the complex disclosed by Ziesel.

### ***Response to Arguments***

7. Applicant's arguments filed July 16, 2007 have been fully considered but they are not persuasive.

8. In regards to Ziesel et al reference, the metal hydride as shown is deprotonated and further produces an acidic solution although it is an intermediate step. Additionally, the metal hydride is isolated and dissolved in a water/acetonitrile solution and irradiated to produce H<sub>2</sub> atoms (Column 126, paragraph 2, page 126). Further, Ziesel notes that the intermediate D (said metal hydride complex) probably would go back to the formation of the starting complex (column 2, last paragraph, page 125). The use of the word "probably" means that this metal hydride complex may or may not go back to the starting complex.

9. Other arguments made in regard to Himeda et al. have been considered and the rejection over Himeda et al. have been withdrawn due to the filing of the certified translation.

**Conclusion**

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ponder N. Thompson-Rummel whose telephone number is 571-272-9816. The examiner can normally be reached on Monday-Friday 7:00 am - 4:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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*Cynthia Kelly*

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